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SOUTHWEST WYOMING

Resource Evaluation

PHASE I
Summaries

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U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office

The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

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Southwest Wyoming Resource Evaluation

Introduction

Oil and gas industry sources predict that southwest Wyoming will become the major natural gas producing region in the United States by the year 2015. Rapid growth in natural gas exploration and drilling began in 1991. This growth raised concerns about the developments' impacts upon other public land resources and uses such as grazing, wildlife, fisheries, recreation, and cultural and the adequacy of the present BLM environmental analysis/project approval process. In order to address these concerns, the Bureau of Land Management initiated a comprehensive three-phase evaluation of its land use planning decisions, impact prediction, and National Environmental Policy Act (NEPA) analyses for the southwest Wyoming area. Current mineral leasing and development proposals will not be affected during the evaluation process.

Evaluation Area

The Southwest Wyoming Resource Evaluation area encompasses 15.6 million acres in all or parts of six southwestern Wyoming counties—Carbon, Fremont, Lincoln, Sublette, Sweetwater, and Uinta (see Map 1 and Table 1). The Green River, Pinedale, and Kemmerer Resource Area offices (Rock Springs District) and the Great Divide Resource Area office (Rawlins District) manage the public lands in the evaluation area. The boundaries of the evaluation area are the Bear River Divide and Wyoming Range on the west, the Wind River Range and extending eastward along the Green and Ferris Mountains on the north, the Continental Divide on the east, and the Uinta Mountains on the south.

Evaluation Objectives

The objectives of the evaluation are to:

1) Define and characterize the affected ecosystems.
2) Identify land use plan decisions and related management prescriptions, their compatability, and determine if established threshold levels have been met or exceeded.
3) Determine scope of NEPA impact prediction and if NEPA analyses are compatible.
4) Identify location and format of government and private baseline environmental and economic data for the area (e.g., threatened and endangered species, cultural resources, big game winter ranges, visual resources, socioeconomic impacts).
5) Identify issues and areas of concern about energy and mineral development in the area.

6) Identify data gaps and future evaluation/research needs for the region from unanticipated or predicted effects.
7) Determine if mitigation measures are satisfactory and establish a consistent set of operation/design standards and practices in the area.
8) Provide a comprehensive ecosystem-wide cumulative benefits and impact evaluation of energy and nonenergy mineral development.

The evaluation will also:

1) Provide data and analyses for decisionmakers to consider when making future strategic decisions on oil and gas leasing.
2) Provide data for decisionmakers to consider for future resource allocations in a resource management plan (RMP).
3) Relate land ownership patterns to oil and gas drainage.
4) Provide a clear assessment of the economic value and importance of the area to local, state, and national economies and to energy and mineral supplies.

Evaluation Phases

Phase One of the evaluation consists of the compilation of all existing data into a common database to serve as a source of information for future decisions. Phase Two of the evaluation consists of the summary, review, and analysis of the data compiled in Phase One. This phase will result in a conclusion about the adequacy of plan decisions and databases, level of cumulative environmental impact, and health of the ecosystem. The extent of Phase Three will depend on which one of three possible conclusions is reached in Phase Two: 1) land use plan implementation and environmental impact statement (EIS) impact prediction are satisfactory—continue current practices and monitoring. Phase Three will not be necessary; 2) data/information is insufficient to make a decision—collect more data or wait for more data to become available; or 3) land use plan implementation and EIS prediction are not satisfactory—corrective planning measures must be taken.

Summaries of the Phase One reports follow.

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Planning Analysis Summary

Planning Analysis Summary

The Planning Analysis report consists of land use planning information and decisions from the resource management plans (RMPs) of the four resource areas which make up the Southwest Wyoming Resource Evaluation (SWRE) study area—Pinedale, Kemmerer, Green River, and Great Divide (Map 1). The information includes land and mineral ownership, agency administrative jurisdictions within the study area, and land use planning decisions which guide the management of BLM-administered public land resources. The land use planning information is presented in a summary table containing land use planning decisions that may affect oil and gas leasing, exploration, and development activities.

The report consists of fourparts:

The first part is a brief explanation of the BLM planning process and a summary table (Table 1) showing the land and mineral ownership and administrative jurisdictions covered by each RMP.

The second part is a table showing the land use and resource program elements considered in each RMP.

The third part is a summary of the general decisions contained in the RMPs, highlighting those that may affect oil and gas leasing, exploration, and development activities in the study area.

The forth part is a table showing excerpts from the land use decisions within each land use plan.

Part One

The purpose of a resource management plan is to provide a comprehensive and environmentally adequate framework for managing and allocating the uses and resources of BLM-administered public lands. The plan provides future direction for site-specific activity planning and implementation of management actions in the planning area.

A draft environmental impact statement (DEIS) is prepared which analyzes the consequences of management alternatives suggested for inclusion for the RMP. The DEIS is then released for public comment. From the DEIS and the public comments, a proposed plan is developed and set forth in the final environmental impact statement (FEIS). Provisions and recommendations from the FEIS are selected for approval and implementation in the record of decision (ROD). The approved RMP supersedes all existing management framework plans and any other planning decisions for the planning area.

Once completed, the RMP is kept current through minor maintenance, or amendments and revisions, as demands on public lands and resources change, as land and resource conditions change, or as new information is acquired. Monitoring and evaluation of the RMP is conducted as necessary. Major actions or changes in regulations may require that changes be made to an RMP within a short timeframe.

Part Two

The Federal Land Policy and Management Act (FLPMA) provides and defines the basic policy for all BLM planning and management activities. BLM must also comply with other laws concerning specific resources, as required by FLPMA.

Table 2 presents a summary comparison of land use and resource management program elements considered in each of the four BLM resource management plans which cover the study area.

> The first column in the table contains the land use and resource management program elements considered in each RMP. (Because of changing procedural requirements and formats of BLM land use plans over the years, some of these elements are addressed under different headings in the four RMPs.) The next four columns include two items for each element. The first is the major laws other than FLPMA that apply to each element (FLPMA applies to every element). The second item is whether or not the element was considered in each of the resource management plans.

Part Three

Table 3 presents a summary of the four RMP's land use decisions and indicates whether or not they may affect oil and gas leasing, exploration, or development activities in the SWRE area. The table is broken down by the land use and resource management program element considered (e.g., Air Quality Management, Fire Management) and by the specific resource management plan.

Part Four

Table 4 provides a more detailed overview of the planning decisions in the four RMPs. This table presents excerpts of decisions for each of the land use and resource management elements that may have an affect on oil and gas leasing and related exploration and development activities. Note that not all elements were considered in each RMP and all elements that were considered do not have an affect on oil and gas activities.

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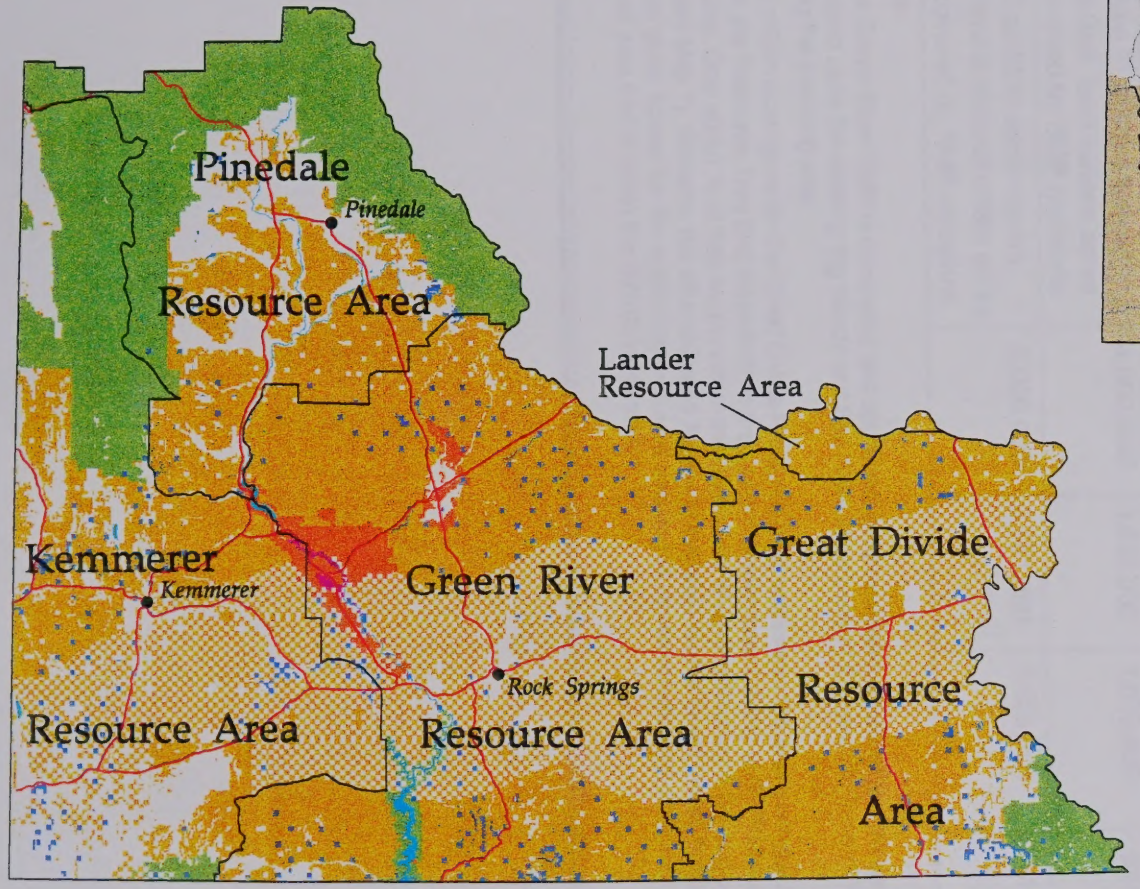
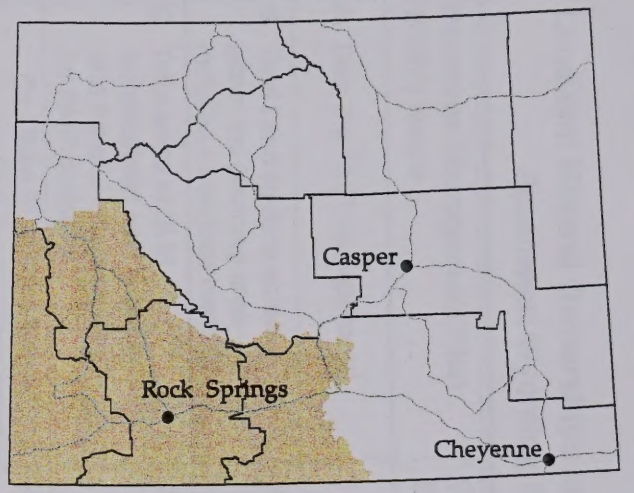


WYOMING



Legend

- Bureau of Land Management
- Bureau of Reclamation
- Forest Service
- Fish and Wildlife
- State

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Table 1

Land and Mineral Ownerships and Administrative Jurisdictions Within the Southwest Wyoming Resource Evaluation Study Area

Resource Management Plan (RMP) Name	Great Divide	Green River	Kemmerer	Pinedale
A. Date the RMP was approved.	11/8/90	not yet signed[1]	4/29/86	12/12/88
B. Total Land surface acres within the planning area - includes all surface ownerships.	12,000,000[2]	5,359,000	3,210,000	4,726,000
C. Total acres of BLM administered land surface and mineral estate covered by RMP decisions	5,000,000[2]	3,635,000	1,870,000	1,185,000
C1. Total BLM administered federal land surface acres covered by RMP decisions	4,000,000[2]	3,635,000	1,630,000	931,000
C2. Total BLM administered federal mineral estate acres covered by RMP decisions	5,000,000[2]	3,581,000	1,870,000	1,185,000

Footnotes:

[1] Until the Green River RMP is completed and approved, daily management decisions will continue to be based upon the existing Big Sandy and Salt Wells Management Framework Plans (MFPs) covering the planning area.

[2] The 12 million acre figure for the Great Divide Resource Area represents the entire administrative area for the Resource Area that extends from the eastern Sweetwater County to the Nebraska State Line. Only about 1/3 of that area is within the Southwest Wyoming Resource Evaluation Study Area (see Map 1). Similarly, the other acreage figures in the table for the Great Divide Resource Area are gross figures for the entire resource area and do not represent only that portion of the resource area that is within the SWRE study area.

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Resource Evaluation

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NEPA Analysis Summary

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PHASE I

NEPA

Analysis Summary

NEPA Analysis Summary

Thirty-one National Environmental Policy Act (NEPA) documents prepared to analyze project proposals for oil and gas development in southwest Wyoming were reviewed for this report. The 31 NEPA documents are listed at the end of this summary. Actual site-specific information for each well is contained in the environmental assessment or impact statement (EA/EIS) completed for the Application for Permit to Drill (APDs) for the well.

The following table presents a summary of the information in the full report. The following definitions explain the terminology used in the table.

Acreage looked at in documents: The area of the project being analyzed in the NEPA document. Each document states how many acres are federally, state, and privately owned and contains a map of the project area. Federal land ownership is further broken down according to which agency administers the land. In cases where the documents did not state the surface ownership, it was derived from maps showing surface ownership and the aerial extent of the project area outlined in the document. The same procedure was used to determine mineral acreage except that mineral ownership maps were used.

Existing conditions before the NEPA documents: The disturbance present before the NEPA document was initiated. If the document did not indicate the disturbance present prior to the document preparation, that section is left blank in the table.

Disturbance Approved by Documents: The maximum disturbance approved by the NEPA document. This does not mean there is presently that much disturbance in the project area but how much activity can take place before another NEPA analysis would have to be done. These numbers do not include the "existing conditions before the NEPA documents." The total potential disturbance is obtained by adding the "existing conditions before the NEPA documents" and the "disturbance approved by documents" acreages.

Number of documents in each resource area: Some of the documents were completed before the present resource areas were established. The documents were counted based on present resource area names and boundaries. The database contains the name of the resource area at the time the document was completed.

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Oil and Gas Development
(Corrected for overlapping information)

General Information

1. Number of documents reviewed	31
2. Number of documents in each county	
a. Carbon	4
b. Lincoln	11
c. Sublette	8
d. Summit (Utah)	1
e. Sweetwater	20
f. Uinta	5
3. Number of documents per resource area	
a. Bear River (Utah)	1
b. Divide	2
c. Great Divide	5
d. Green River	16
e. Kemmerer	5
f. Pinedale	7

Acreage looked at in documents

1. Surface acreage	
a. Total acres	1,640,394
b. Total BLM administered acres	896,112
c. Total USFS administered acres	105,422
d. Total other federal agency administered acres	82,535
e. Total State administered acres	59,982
f. Total private acres	494,343
2. Mineral estate	
a. Total acres	1,640,394
b. Total federal minerals	1,106,764
c. Total State minerals	63,857
d. Total private minerals	469,773

Existing Disturbance

1. Total disturbance	35,753
2. Acres rehabilitated	20,140
3. Wells drilled	2,648
4. Wells abandoned	553
5. Miles of road	4,181
6. Miles of pipeline	1,000
7. Miles of power line	236
8. Acres disturbed by wells	6,095
9. Acres disturbed by roads	10,583
10. Acres disturbed by pipelines	5,795

11. Acres disturbed by power lines	0
12. Acres disturbed by other	1,639
13.Total disturbance calculated	24,112

General Infrastructure Disturbance

1. Acres disturbed by railroads	1,550
2. Acres disturbed by highways/roads	9,791
3. Acres disturbed by municipalities	94
4. Acres disturbed by power Lines	0

Disturbance approved by documents

1. Total acres disturbed	52,948
2. Wells authorized to be drilled	4,837
3. Wells estimated to be abandoned	20
4. Estimated miles of new roads-	1,550
5. Estimated miles of new pipelines	2,868
6. Estimated miles of new roads/pipelines	328
7. Estimated miles of new power line ROWs	135
8. Estimated acres disturbed by wells	19,130
9. Estimated acres disturbed by new roads	8,249
10. Estimated acres disturbed by new pipelines-	17,222
11. Estimated acres of disturbance by new roads/pipelines	4,595
12. Estimated acres disturbed by new power line ROWs	1,017
13. Estimated acres disturbed by new other disturbance	2,806
14. Estimated acres of short term disturbance	50,932
15. Estimated acres of long term disturbance	13,998
16. Total disturbance calculated	53,068

Rehabilitation Planned

1. Acres from wells	11,491
2. Acres from roads	2,717
3. Acres from pipelines	14,085
4. Acres from roads/pipelines	2,640
5. Acres from power lines	903
6. Total acres planned to be reclaimed	31,835

Calculated Long Term Disturbance	**21,233**

Documents reviewed:

Riley Ridge (EIS)
Dripping Rock Unit (EA)
Luckey Ditch Unit Well# C-5 Alt. #F-8 (EA)
Hickey & Table Mtn. (EIS)
Cedar Canyon Gas well H-18 (EA)
Sierra Madre Unit (EA)
Soda Unit (EA)

Documents reviewed: (continued)

1989 Drilling Proposal LaBarge Platform (EA)
Nitchie Gulch Well # 22-8 (EA)
Cedar Canyon State 30-16 (EA)
Moxa Arch Natural Gas Production Project EA
Pacific Gas & Electric Fontenelle Unit (EA) Infill Project
Hay Reservoir (EA)
Supplemental EA to Moxa Arch
East LaBarge Infill Project (EA)
Greater Wamsutter I (EA)
Texaco & Washington Energy Infill Drilling Projects (Supplemental EA)
Mulligan Draw (EIS)
Dripping Rock Unit/ Cedar Breaks Area Supplement (EA)
Washington Energy Infill Project (WE) (Supplemental EA)
Bird Canyon Project (EA)
Burley Field Project Area (EIS)
Mobil Project Area (Tip Top and Hogsback Unit) (EA)
Jonah Field (EA)
Creston/Blue Gap (EIS)
Bravo Unit Field Development (EA)
HS Resources Natural Gas Exploration Project (EA)
Stagecoach Draw (EIS)
Greater Wamsutter Area II (EIS)
Fontenelle Natural Gas Infill Drilling Projects (EIS)

SOUTHWEST WYOMING

Resource Evaluation

PHASE I

Landtype Delineation Summary

Delineations of Landtype Association For Southwest Wyoming Summary

The delineation of landtype associations for southwest Wyoming was initiated as part of the Southwest Wyoming Resource Evaluation. This is the third in a series of reports on landtypes in Wyoming that has been completed in conjunction with the University of Wyoming.

This report was prepared by the University of Wyoming, Department of Botany, for the Bureau of Land Management to provide for the delineation of landtype associations within the Great Divide Basin in southwest Wyoming. The location of the work area was Lincoln, Uinta, Sublette, and Sweetwater counties together with portions of Fremont and Carbon counties lying south and west of the Continental Divide.

The goal of this work is to map terrain features within southwest Wyoming having similar terrain configuration, ecological properties and management implications within which situational landscape-ecosystems can logically and conveniently be defined. This is a terrestrial-centered approach—dividing terrain into map units in terms of terrain features, but also recognizing that associated vegetation and wildlife are also characteristic of the unit.

For the purpose of this mapping work, the Landtype Associations should be viewed aggregates of similar landscapes, regardless of whatever criterion is used for landscape definition. Landtype Associations are relatively large units featuring predictably occurring terrain features. Diagnostic terrain features characteristic of Landtype Associations include the form, extent and nature of ridges, cliffs, rock outcrops, talus slopes, fans, stream channels and associated terraces, benches, ravines, etc. Each of these terrain features may bear different ecosystem components in terms of plant, animal and microbial populations and functions and can be viewed as local area ecosystems.

In deciding which geographic features should be mapped as a Landtype Association, the preparers asked themselves the practical question:

> **Would this feature be recognized by land users and managers in the field, and would they agree that it is sufficiently different from surrounding terrain that they would consider its management differently?**

A variety of statistics were calculated for the land units delineated in this project including statistics for area, elevation, annual precipitation, land cover, and geology. This was based on digitized information secured from a variety of sources.

Southwestern Wyoming is essentially a large basin, termed by some the Wyoming Basin, bordered by mountain ranges. The history of mountain building beginning about 65 million years ago includes the history of fluvial deposition of erosional products and later aeolian deposition of volcanic products during the Tertiary Period into the inter-range areas presently comprising the basin. Between 65 and

5 million years, the basins were, at times, filled sufficiently that the areas, as viewed by some, were aggradational plains with only the highest summits revealed above the Tertiary sedimentary layers. The basins were essentially filled with weakly consolidated debris. Following regional uplift approximately 5 million years ago, erosional rates were accelerated so that the basins have become partially excavated. The present-day, regional landscape consists of partially revealed harder rocks associated with the mountains (mostly Precambrian and Paleozoic rocks) and the sandstones of Mesozoic strata that were deformed into hogbacks and cuestas associated with mountain-building. These harder rocks have been, and are being, etched from the matrix of highly erodible Tertiary materials. The tertiary materials themselves, with some important exceptions, usually have only small degrees of difference in their erodibility so that much of the topography found within the basins is mostly derived from accidents of position with respect to headwater versus mainstem elevations and the influence of Pleistocene glacial/fluvial deposition events. Sections, subsections and Landtype Associations described in the report and accompanying maps are defined primarily by the lithology and subsequent geomorphology of these exposed uplands and partially excavated plains.

In addition to geology, elevation, precipitation, land cover types, surficial geology, and general soils groups are provided as part of the Landtype Associations. These elements provided for the landtype associations and help to tie all the living and abiotic elements the use the areas into a usable unit for planning and decision making. They represent in the broadest sense, on a local level, a division of natural systems.

The attached map shows the landtypes that were delineated through this project. The attached table gives the area associated with each of the landtypes delineated.

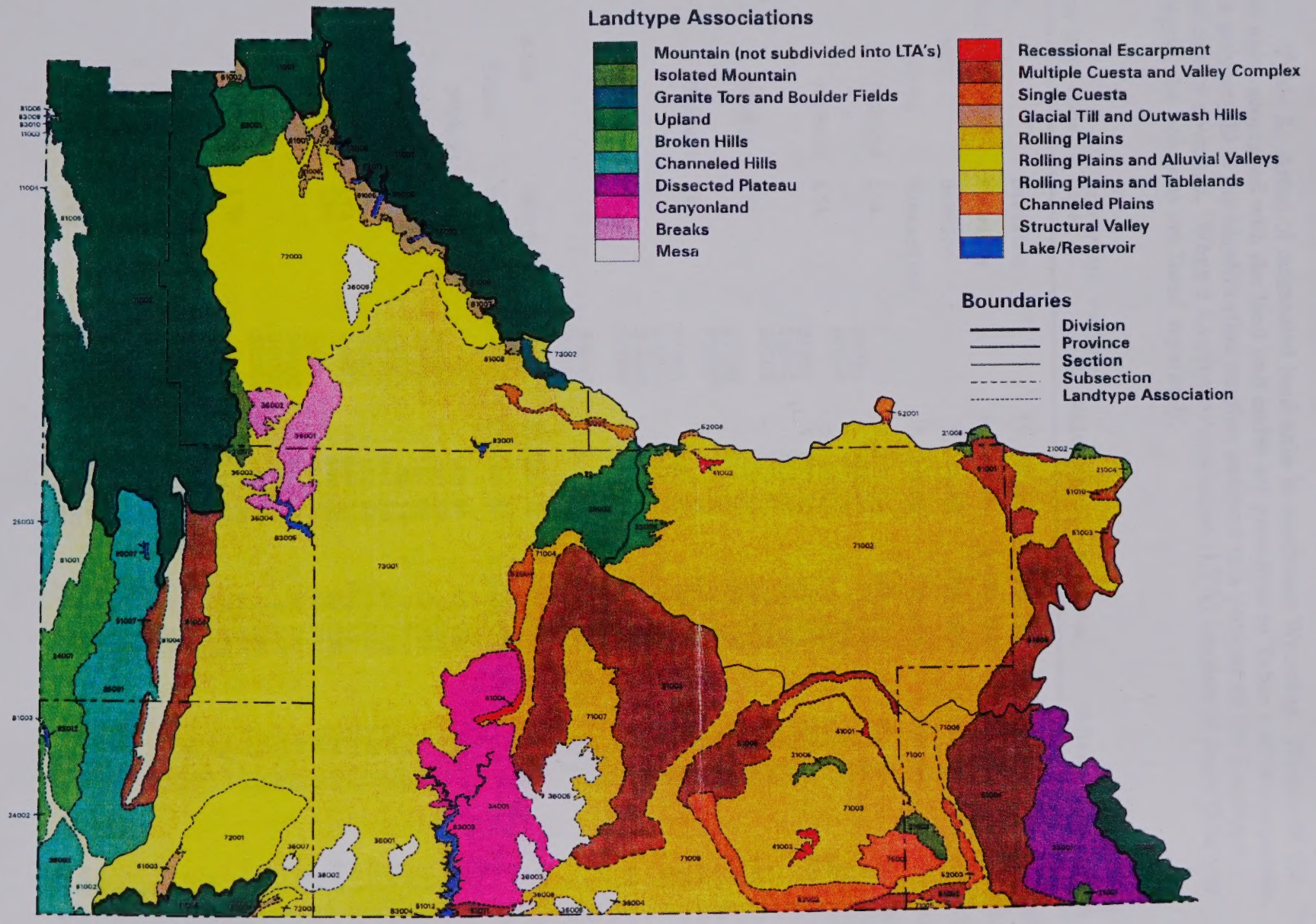
Landtype Associations
Mountain (not subdivided into LTA's)
Isolated Mountain
Granite Tors and Boulder Fields
Upland
Broken Hills
Channeled Hills
Dissected Plateau
Canyonland
Breaks
Mesa
Recessional Escarpment
Multiple Cuesta and Valley Complex
Single Cuesta
Glacial Till and Outwash Hills
Rolling Plains
Rolling Plains and Alluvial Valleys
Rolling Plains and Tablelands
Channeled Plains
Structural Valley
Lake/Reservoir
Boundaries
Division
Province
Section
Subsection
Landtype Association

Table 3. Areas of delineated land units in southwest Wyoming. Names of the land units associated with the land unit codes are presented in Table 1 of the appendix. The polygon ID is the identification number assigned to a polygon of the Landtype Association coverage. When a Landtype Association (LTA) consists of more than one polygon, the polygons are listed separately.

Land Unit Code	Hierarchy Level	Polygon ID	Kilometer^2	Hectares	Miles^2	Acres
340	Division		51,897.24	5,189,724	20,037.52	12,823,808
342	Province		51,897.24	5,189,724	20,037.52	12,823,808
342E	Section		5,086.65	508,665	1,963.96	1,256,912
342Ea	Subsection		5,086.65	508,665	1,963.96	1,256,912
342Ea24	LTA		1,059.04	105,904	408.89	261,688
		24001	983.78	98,378	379.84	243,092
		24002	75.26	7,526	29.06	18,596
342Ea25	LTA		2,192.62	219,262	846.57	541,795
		25001	1,763.16	176,316	680.76	435,676
		25002	293.96	29,396	113.50	72,638
		25003	135.50	13,550	52.32	33,481
342Ea51	LTA		805.50	80,550	311.00	199,039
		51006	691.20	69,120	266.87	170,795
		51007	114.30	11,430	44.13	28,244
342Ea81	LTA		1,017.18	101,718	392.73	251,346
		81001	397.19	39,719	153.35	98,146
		81002	215.77	21,577	83.31	53,317
		81003	4.91	491	1.90	1,214
		81004	399.31	39,931	154.17	98,670
342Ea83	LTA		12.32	1,232	4.75	3,043
		83007	5.60	560	2.16	1,384
		83012	6.71	671	2.59	1,659
342G	Section		36,990.70	3,699,070	14,282.11	9,140,403
342Ga	Subsection		23,730.85	2,373,085	9,162.48	5,863,892
342Ga21	LTA		155.95	15,595	60.21	38,535
		21001	28.93	2,893	11.17	7,149
		21007	127.02	12,702	49.04	31,386
342Ga22	LTA	22001	89.14	8,914	34.42	22,027
342Ga23	LTA	23002	641.75	64,175	247.78	158,576
342Ga33	LTA	33001	1,155.85	115,585	446.27	285,610
342Ga34	LTA	34001	1,644.01	164,401	634.75	406,235
342Ga35	LTA		599.98	59,998	231.65	148,256
		35001	403.31	40,331	155.72	99,659
		35002	122.11	12,211	47.15	30,174
		35003	35.11	3,511	13.55	8,675
		35004	39.45	3,945	15.23	9,748
342Ga36	LTA		444.28	44,428	171.54	109,781
		36001	51.06	5,106	19.71	12,617
		36002	184.12	18,412	71.09	45,495
		36003	101.07	10,107	39.02	24,974
		36004	33.73	3,373	13.02	8,334
		36006	18.18	1,818	7.02	4,492
		36007	15.95	1,595	6.16	3,941
		36008	40.18	4,018	15.51	9,928
342Ga41	LTA	41004	56.59	5,659	21.85	13,983
342Ga51	LTA		1,239.94	123,994	478.74	306,389
		51004	1,172.86	117,286	452.84	289,813

Table 3 continued

Land Unit Code	Hierarchy Level	Polygon ID	Kilometer²	Hectares	Miles²	Acres
		51011	64.72	6,472	24.99	15,994
		51012	2.36	236	0.91	582
342Ga52	LTA		208.49	20,849	80.50	51,518
		52004	111.87	11,187	43.19	27,643
		52005	96.62	9,662	37.30	23,874
342Ga61	LTA		85.12	8,512	32.86	21,033
		61003	46.55	4,655	17.97	11,503
		61004	18.87	1,887	7.29	4,663
		61008	19.70	1,970	7.61	4,868
342Ga71	LTA		2,259.70	225,970	872.47	558,372
		71004	354.03	35,403	136.69	87,481
		71005	28.35	2,835	10.95	7,005
		71006	309.13	30,913	119.35	76,385
		71008	1,568.19	156,819	605.48	387,501
342Ga72	LTA		937.51	93,751	361.97	231,658
		72001	875.79	87,579	338.14	216,407
		72002	61.72	6,172	23.83	15,251
342Ga73	LTA		14,057.50	1,405,750	5,427.60	3,473,609
		73001	14,023.73	1,402,373	5,414.56	3,465,265
		73002	33.77	3,377	13.04	8,344
342Ga83	LTA		155.04	15,504	59.86	38,310
		83001	8.94	894	3.45	2,208
		83003	113.69	11,369	43.89	28,092
		83004	0.82	82	0.32	202
		83005	31.60	3,160	12.20	7,809
342Gc	Subsection		3,988.10	398,810	1,539.81	985,461
342Gc36	LTA	36005	456.74	45,674	176.35	112,861
342Gc51	LTA	51009	2,827.96	282,796	1,091.88	698,789
342Gc71	LTA	71007	703.40	70,340	271.58	173,810
342Gd	Subsection		4,724.96	472,496	1,824.31	1,167,537
342Gd21	LTA		148.94	14,894	57.51	36,804
		21003	98.47	9,847	38.02	24,331
		21005	50.48	5,048	19.49	12,473
342Gd41	LTA		73.92	7,392	28.54	18,265
		41001	34.41	3,441	13.29	8,502
		41003	39.51	3,951	15.25	9,763
342Gd51	LTA		713.08	71,308	275.32	176,201
		51002	141.62	14,162	54.68	34,994
		51005	571.46	57,146	220.64	141,207
342Gd52	LTA		520.35	52,035	200.91	128,580
		52002	438.03	43,803	169.12	108,236
		52003	82.33	8,233	31.79	20,343
342Gd71	LTA		3,002.33	300,233	1,159.20	741,875
		71001	858.07	85,807	331.30	212,028
		71003	2,144.26	214,426	827.90	529,847
342Gd75	LTA	75001	266.34	26,634	102.83	65,812
342Ge	Subsection		4,546.80	454,680	1,755.52	1,123,513
342Ge23	LTA	23001	503.87	50,387	194.55	124,507
342Ge36	LTA	36009	136.92	13,692	52.86	33,832
342Ge61	LTA		519.02	51,902	200.39	128,250
		61001	73.59	7,359	28.41	18,185
		61002	43.10	4,310	16.64	10,651
		61005	252.82	25,282	97.61	62,472
		61006	88.03	8,803	33.99	21,751
		61007	35.09	3,509	13.55	8,671
		61009	26.39	2,639	10.19	6,520

Table 3 continued

Land Unit Code	Hierarchy Level	Polygon ID	Kilometer²	Hectares	Miles²	Acres
342Ge72	LTA	72003	3,347.06	334,706	1,292.30	827,058
342Ge83	LTA		39.92	3,992	15.41	9,865
		83002	6.94	694	2.68	1,714
		83006	20.52	2,052	7.92	5,072
		83008	5.12	512	1.98	1,266
		83011	7.34	734	2.83	1,813
342X	Section		9,819.88	981,988	3,791.46	2,426,493
342Xa	Subsection		9,819.88	981,988	3,791.46	2,426,493
342Xa21	LTA		82.63	8,263	31.90	20,418
		21002	27.75	2,775	10.71	6,857
		21004	14.55	1,455	5.62	3,594
		21006	40.33	4,033	15.57	9,967
342Xa23	LTA	23003	192.53	19,253	74.34	47,574
342Xa41	LTA	41002	18.37	1,837	7.09	4,540
342Xa51	LTA		1,102.44	110,244	425.65	272,412
		51001	284.68	28,468	109.92	70,345
		51003	66.96	6,696	25.85	16,547
		51008	718.00	71,800	277.22	177,418
		51010	32.79	3,279	12.66	8,102
342Xa52	LTA		40.18	4,018	15.51	9,929
		52001	31.68	3,168	12.23	7,828
		52006	8.50	850	3.28	2,101
342Xa71	LTA	71002	8,383.73	838,373	3,236.96	2,071,620
M330	Division		10,734.06	1,073,406	4,144.42	2,652,386
M331	Province		10,734.06	1,073,406	4,144.42	2,652,386
M331D	Section		6,862.65	686,265	2,649.67	1,695,761
M331D-	Subsection		6,862.65	686,265	2,649.67	1,695,761
M331D-11	LTA		6,493.57	649,357	2,507.17	1,604,562
		11002	6,490.45	649,045	2,505.96	1,603,791
		11003	2.94	294	1.13	725
		11004	0.18	18	0.07	45
M331D-81	LTA		365.57	36,557	141.15	90,332
		81005	360.08	36,008	139.03	88,975
		81006	5.49	549	2.12	1,357
M331D-83	LTA		3.51	351	1.36	868
		83009	2.09	209	0.81	517
		83010	1.42	142	0.55	350
M331E	Section		385.87	38,587	148.98	95,347
M331Ea	Subsection	11006	385.87	38,587	148.98	95,347
M331I	Section		417.36	41,736	161.14	103,129
M331Iu	Subsection	11005	417.36	41,736	161.14	103,129
M331J	Section	11007	2,635.22	263,522	1,017.46	651,163
M331X	Section	11001	432.96	43,296	167.17	106,985

SOUTHWEST WYOMING
Resource Evaluation

PHASE I

Socioeconomic Analysis Summary

SOUTHWEST WYOMING

Resource Education

PHASE I

Socioeconomic Analysis Summary

Socioeconomic Analysis Summary

Two reports summarize the economic characteristics and historical trends for the counties in the Bureau of Land Management's Southwest Wyoming Resource Evaluation (SWRE) area. For the purpose of these reports, the SWRE area is defined as the Wyoming counties of Carbon, Lincoln, Sublette, Sweetwater, and Uinta. The Department of Agricultural Economics, through the University of Wyoming's Cooperative Extension Service, prepared the reports.

In a rapidly changing world, communities need up-to-date and accurate information regarding the effects of changes in the structure of their local, regional, or state economy. Information on current and potential economic impacts at the local, regional, or state level can assist the decision-making process by providing a better understanding of how the local economy functions, the critical linkages with the rest of the world, and how a change is likely to effect a region's economy.

The first report (February 1996) from this evaluation provides information on the overall economic characteristics and historical trends for southwest Wyoming. It includes information on economic growth, economic diversity, assessed valuation, fiscal revenues, and school attendance. The first report also provides information on travel and outdoor recreation, federal land payments, crime, law enforcement, medical, transportation, grazing, and timber.

Like much of the rest of Wyoming, the economic trends in southwest Wyoming in recent years have reflected the expansion and contraction of the area's mineral industries. Since much of the production and processing activity associated with Wyoming's coal, trona, and oil and gas industries are concentrated in southwest Wyoming, the fluctuations in the area's economy has tended to follow state trends. The period from 1975 to 1993 can be separated into four separate phases in terms of economic activity in southwest Wyoming. The period from 1975 to 1981 represents an expansion phase resulting from increased development in the mineral industry. The period from 1981 to 1985 represents a leveling of this expansion phase as development projects in the mineral industry were completed. The period from 1985 to 1990 represents a contraction phase as the price of many minerals declined on the world market. Finally, since 1990 the area has seen a slow but stable growth phase as the mineral industry has stabilized and other sectors have expanded.

The population, employment, and income data for southwest Wyoming during this time reflects these four phases, although the years may vary slightly. The population in southwest Wyoming increased by 30,200 people between 1975 and 1981 (Figure 1). This represents a 42 percent increase in just six years. Between 1981 and 1985 the area's population grew by less than five percent. However, between 1985 and 1990 the population declined by 13,400 or about 15 percent. From 1990 to the present, population growth has averaged less than one-half percent per year.

During this time period, the mineral employment increased 122 percent between 1975 and 1981 and then declined by 51 percent (Figure 2). Since 1990 mineral sector employment has changed by less than one percent. There has been some growth in the processing sector associated with the area's mineral production. Reviewing the employment situation since 1987, which is close to the bottom of the slump (Figure 3), shows the changes in the employment by sector compared to 1993. The services and retail trade sectors show the greatest gain.

Per capita income for residents of southwest Wyoming steadily increased from $6,499 in 1975 to $17,979 in 1993. In 1975 southwest Wyoming per capita income was 102 percent of the Wyoming average and 107 percent of the U.S. average. By 1993, the area's per capita income was only 91 percent of the Wyoming average and only 86 percent of the U.S. average. A comparison of earnings per job in southwest Wyoming compared to all of Wyoming is presented in Figure 4. Manufacturing, construction, transportation, and public utilities, along with wholesale trade, have higher average earnings in southwest Wyoming than the average for Wyoming.

Southwest Wyoming is a favorite place for Wyoming residents and out-of-state visitors to recreate. Wyoming residents favor off-road-vehicling (ORV) first, followed by big game hunting, snowmobiling, fishing, backpacking, and camping (Figure 5). A total of 849,00 visits were recorded on BLM surface sites in 1995. Since BLM manages 49 percent of the surface area in southwest Wyoming, extrapolation of these data suggest 1,700,000 site visits to southwest Wyoming in a year.

The five county region provides slightly more than 22 percent of the state's grazing for livestock and sheep. About 43 percent of the grazing that BLM administers is in southwest Wyoming.

Average daily attendance at schools reflects the population and employment pattern of the state and also southwest Wyoming, but in a subdued manner. Attendance of 23,494 was recorded in the 1983-84 school year, and reached a maximum of 25,395 in the 1985-86 school year, a seven percent increase. Attendance declined to a low of 23,564 in 1988-89, still higher than 1983-84, and has increased steadily since that time at a rate of one percent per year.

The tax base of counties in southwest Wyoming is also dependent on mineral production which accounts for 62 percent of the area's total assessed valuation in 1993. Because of price dependency, the area's tax base has fluctuated with the change in mineral prices (Figure 6). The region's total tax base increased from $1.5 billion in 1980 to $3.0 billion in 1985. Since 1985 the area's total tax base has declined to $2.4 billion in 1993.

The second report looks in greater detail at the economy of southwest Wyoming. While the first report considered the current structure and overall trends within the southwest Wyoming economy, the second report looks at specific economic activities and the impacts on the southwest Wyoming economy from potential changes in these economic activities. The second report contains four sections. The first section considers recreation on lands managed by Bureau of Land Management (BLM), per unit values of outdoor recreation, and big game hunting in

southwest Wyoming. The second section examines the tax revenue to local governmental units in the region from mineral production in southwest Wyoming. The third section summarizes Payment-in-Lieu of Taxes (PILT) payments for counties in southwest Wyoming over the past five years and projects these forward based on current levels of production to 1999. The final section provides estimates of the per unit economic impacts, in terms of economic activity, jobs, and income, for selected economic activities found in the southwest Wyoming economy. Economic activities considered include: oil and natural gas development and production, coal production, trona (soda ash) production, outdoor recreation, livestock grazing, and timber production.

SOUTHWEST WYOMING

Resource Evaluation

PHASE I

Cultural Resource Data Management Context

SOUTHWEST WYOMING

Resource Evaluation

PHASE I

Cultural Resource Data Management Context

Cultural Resource Data Management and Context Summary

The Cultural Resource Data Management and Context report consists of two parts. The first is the Cultural Resource Data Management which deals with the automation of the cultural resource data base. The second part, Archaeological Context, is the first phase in the development of a context that deals with the interpretation of the historical value of the archaeological resource in southwest Wyoming

Cultural Resource Data Management

The following goals of the data management project were identified by the Wyoming Cultural Records Office (WYCRO), a division of the State Historic Preservation Office (SHPO).

1. Provide for outside user access to information
2. Allow for user data input
3. Improve the quality and quantity of data available on the system
4. Streamline the current work flow process
5. Develop a fully rational data management system with validation
6. Determine the most effective way to implement cultural resources GIS

The following work needs to be completed in order to meet the immediate needs of cultural resources staffs.

1. Open up the current databases for queries by agency and consulting archaeologists.
2. Develop a sound business model and data models that will capture the important information. This work has already begun.
3. Complete new site form. The draft of the new site form needs to be revised and sent for general review as swiftly as possible because the site form attributes will need to be captured in the data model and field staff need the form for the next field season.
4. Begin GIS development.
5. Develop a logical conversion and edit schemes for converting existing data, including Review and Compliance, into new formats or consistent formats.
6. Develop a manual of new procedures that will follow the system implementation.

Archaeological Context Development

A prehistoric archaeological context is an organizing structure for interpreting prehistory. It attempts to group information about prehistoric resources that share a common theme, common geographical area, and/or a common time period. The

context becomes a foundation for decisions about the planning, identification, and treatment of prehistoric resources based upon comparative significance. The report entitled "Archaeological Research Issues in Southwestern Wyoming" is the first phase in developing a prehistoric context for southwestern Wyoming. Its goals were a summary of the work identified by The Southwestern Wyoming Prehistoric Context Conference held in 1994 and the Green River Basin Archaeology Symposium held at the 2nd Biennial Rocky Mountain Anthropological Conference in 1995. The report was compiled by the University of Wyoming, Department of Anthropology and accomplishes the following:

1. Defines Research Issues: The basic assumption is that an understanding and managing the material culture and its context involves looking at different research issues identified by the archaeologists as pertinent to the study of prehistory of the area.
   a. Methodological Issues: Whether or not field and laboratory methods are adequate, how best to report and evaluate the information, and compliance with Section 106 of the National Historic Preservation Act (NHPA).
   b. Middle Range Research Issues: Links archaeological methods to anthropological theories which allows managers to make better decisions on resource significance. Includes studies in taphonomy, site formation, site structure, paleoclimate, flora, fauna, geology, and soils which provide an understanding of how the archaeological record in the area was formed.
   c. Anthropological Issues: Provides models and understanding about prehistoric human behavior. Allows the archaeologist to understand their archaeological record, prioritize resource significance, and improve decision-making about management of the cultural resource.
2. Summarizes Current Archaeological Knowledge/Data Gaps:
   a. Chronology: Paleoindian/Early Archaic; Middle and Late Archaic; Late Prehistoric/Protohistoric.
   b. Theoretical Issues: Population movements, social Dynamics, settlement/mobility.
   c. The Archaeological Record: Housepits and other domestics; ceramics; subsistence; firepits; lithic technology; site types; geoarchaeology; burials/human remains; rock art.

The following additional steps will need to be completed in developing a prehistoric context for southwestern Wyoming:

1. Continuation, completion, and evaluation of the work within the Moxa Arch to devise a research design to improve archaeological decision-making on the part of BLM archaeologists and managers.
2. Continuation of the upgrade and expansion of the Wyoming Cultural Records Office (WYCRO) data base beyond a vehicle for the start of the Section 106 compliance process.

3. Movement of the WYCRO data base into a Geographic Information System that will provide adequate information to allow decisions about potential project locations.
4. Linkage of the WYCRO data base with the State Archaeologist's Office/ University of Wyoming Archaeological Repository data base and making necessary improvements to the latter system to make it more easily accessible.
5. Support for projects that incorporate and attempt to answer the research issues posed in the report.
6. Synthesize the grey literature (unpublished cultural resources reports). This would involve three levels of synthesis:
   a. Landscape Data: Synthesis of information from ongoing environmental studies and paleoenvironmental research.
   b. Site Excavation Data: Synthesis of information relating to the archaeological record.
   c. Combined Data: Synthesis of both landscape and archaeological data which addresses the research issues and specifically addresses management issues.

SOUTHWEST WYOMING

Resource Evaluation

PHASE I

Issue Identification Summary

SOUTHWEST
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GROUP

PHASE I

Issue Identification
Summary

Southwest Wyoming Resource Evaluation Issue Identification Summary

The issues to be considered during the Southwest Wyoming Resource Evaluation (SWRE) were identified by members of the public; government agencies (e.g., U.S. Forest Service, Wyoming Game and Fish Department); environmental, conservation, and user organizations; industry; the BLM; and other interested groups. The issues are grouped into the following categories:

1. **Resource Issues:** Issues identified through the scoping and environmental document analysis stages of the National Environmental Policy Act (NEPA) process.
2. **Public Comment Issues:** Issues identified through public comments on environmental assessment (EA) and environmental impact statement (EIS) documents.
3. **Other Issues:** Issues identified by public input other than through the NEPA process, e.g., the Green River Basin Advisory Committee (GRBAC)

The resource and public comment issues were derived from the following documents:

- Enron Oil and Gas Company East LaBarge Infill Drilling Project EA
- Enron Burley Area EIS
- Creston/Blue Gap Project EIS
- Texaco Stagecoach Draw Unit EIS
- Greater Wamsutter Area II EIS
- Fontenelle Natural Gas Infill Drilling Projects EIS
- Expanded Moxa Arch Area Natural Gas Development Project EIS
- HS Resources Inc Natural Gas Exploration Project EA

Resource Comment Issues

- Impact of development on air quality
- Socioeconomic impact to state and local economies
- Surface and ground water quality and quantity protection
- Impacts to wildlife and wildlife habitat—big game winter range and migrations, antelope, deer, elk, sage and sharptailed grouse, raptors, nongame species
- Impacts to wetlands and aquatic habitats (fisheries)
- Impacts to sensitive, priority, and threatened and endangered species (T&E) including downstream fish species
- Access to public lands
- Impacts to potential minable coal beds
- Impacts to highly erodible and unstable soils

- Impacts to paleontological resources
- Reclamation and reseeding with native species
- Noxious weed control
- Impacts to cultural/historical resources including historic trails
- Impacts of development to recreation
- Impacts to visual resources in Seedskadee National Wildlife Refuge, National Historic Trails
- Cumulative impacts analysis
- Impacts to wild horses
- Existing road and pipeline problems
- Increased traffic
- Additional disturbance from construction, use of existing roads
- Disruption of livestock management operations
- Potential impacts to Wilderness Study Areas
- Proper and timely reclamation of disturbed areas
- Possible ground water contamination from drilling, operating, and plugging and abandoning wells
- Management concern over effect of drainage on federal minerals
- Impacts from increased human activity e.g., poaching
- Impacts associated with noise due to construction activities and natural gas production operations

Public Comment Issues

- Failure to analyze or incomplete analysis of cumulative impacts; direct and indirect impacts as they relate to antelope, deer, elk, sage grouse, and raptors; air quality; visibility; water quality; plant species; wetland, riparian areas; water resources; fisheries; and recreation
- A reasonable range of alternatives was not addressed
- Impacts to protected wildlife and plant species were not adequately addressed
- Economic impacts of the projects on the cities, counties, and state
- Stipulations, requirements, and document processing time are excessive

Other Issues

The Green River Basin Advisory Committee (GRBAC) identified the following issues:

- Streamlining the NEPA process
- Road design standards
- Ecoroyalty relief for the oil and gas program
- Mitigation and monitoring
- Transportation planning

SOUTHWEST WYOMING

Resource Evaluation

PHASE I

Existing Data Sources Summary

Existing Data Base Analysis Summary

The analysis of existing data bases that relate to the Southwest Wyoming Resource Evaluation (SWRE) area is one of the key elements of the SWRE project. The analysis indicates what data is currently available, what data is available but needs to be digitized, and what data gaps exist. The report will help BLM determine data collection and digitization priorities and facilitate the analysis of significant issues in the area.

The data themes identified for the Green River Resource Management Plan (RMP) were used as the basis of the analysis (list attached). A total of 87 data themes were identified in the Green River RMP. Not all of the data themes area are relevant to each of the four resource areas included in the SWRE.

The report contains a list of the data themes, an explanation of each data theme and its format, and indicates which data themes are available in each of the four SWRE resource areas. The available data bases are located in BLM files and were assembled either by BLM or other agencies (e.g., Wyoming Game and Fish Department).

The existing data is in the following formats:

ALMARS - Automated Lands and Minerals Recordation System
AUTOCAD
DIGITAL (GIS-MOSS OR ArcInfo format)
University of Wyoming GAP Vegetation
National Wetlands Inventory
Extrapolated from well data
Mylar
Paper map, reports, master title plats, RMP data bases

Data Themes

Theme	Contents
AC.ACEC	area of environmental concern
AH.ANTELOPEHERD	antelope herd units
ALLOTMENT	grazing allotment boundaries
AN.ANTELOPE	antelope seasonal use areas
AQ.ACQUISITIONS	land acquisitions
ATMR	antelope migration routes
BC.BACKBYWAYS	back country byways
BOUNDARIES	administrative boundaries—State, BLM
BP.BRINEPOT	brine potential
CA.PARMOOSE	moose birthing areas
CB.COUNTYBNDY	county boundaries
CD.COALMETHDEV	coal bed methane development pot
CITYX1	Rock Springs expansion area
CM.CMUREVOCATION	classification multiple use revocation
CO.CORRIDORS	right-of-way corridors
CP.COALLEASE	coal lease areas
CS.COMMUNICATION	communication sites
CT.CITYTOWNS	citys and towns
EH.ELKHERD	elk herd units
EKMR	elk migration routes
EL.ELK	elk seasonal use areas
FENCES	fences
FI.REP_FIRELOC	represenative fire locations
FLOODPLAINS	flood prone areas, floodplains
FM.FLUIDMINPOTENT	fluid mineral potential
FZ.FMZ	fire management zones
GL.GEOHAZARDS1	fault lines
GP.GEOHAZARDS1	windblown sands, landslide areas
GR.GEOTHRES	geothermal resources
GS.GEOHAZARDS3	H_2S wells
GW.GROUNDWATER	ground water recharge area
HISTORIC.TRAILS	historic trails
HS.HISTORICSITE	historic sites
KR.KRCRA	known recoverable coal resourse area
KS.KSLA	known sodium lease area
LANDLINES	land net, township and section lines
LD.LANDDISPOSAL	lands that may be disposed of
MC.MININGCLAIM	mining claims
MDMR	mule deer migration routes
ME.MINES	mine sites
MH.MOOSE	moose seasonal use area
ML.MULEDEERHERD	mule deer herd units

MN.MINEPERMIT	mine permit areas
MO.MOOSEHERD	moose herd units
MP.MINMATPOT	mineral material potential
MR.MAJORESERVOIR	major reservoirs, lakes
MS.MINMATSITES	mineral material sites
MSMR	moose migration routes
MU.MULEDEER	mule deer seasonal use areas
OM.PROPOGMGMT	proposed oil & gas management
OP.OGPOTENTIAL	oil & gas potential
OS.RECREATION	recreation opportunity spectrum
OW.OILSHALEWA	oil shale withdrawal area
PAR.ELK	elk birthing areas
PC.COALPOTENTIAL	coal potential
PL.PLANTS	industrial plant areas
PM.PARMULED	mule deer birthing areas
PN.PALEONRES	paleontological resources
PO.ACECPROP	proposed area of environmental con
PP.PUBLICPURPOSE	recreation & public purpose lands
PW.PROPWILDERNESS	proposed wilderness areas
PZ.PRECIPZONE	precipitation zones
R.OWNERSHIP	mineral & surface ownership
RA.RAPTORS	raptor nesting sites
RE.RECREATION	recreation sites snowmobile, hiking trails
RI.RANGEIMPROVE	range improvements: pipelines reservoirs, springs, wells, etc.
RL.ROW	railroads, pipelines, powerlines
SB.SUBSURFFCMD	federal coal mgmt decisions subsurface
SD.SODIUMLA	sodium lease areas
SF.SURFFCMD	federal coal mgmt decisions-surface
SG.SAGEGROUSE	sage grouse lek areas
SM.SPECMGMTAREA	special mgmt area - Red Desert WA
SOILS	soil types
SZ.SWDISPOSAL	solid waste disposal
TI.TIMBER	timber stand data
TP.SODIUMDEVPOT	sodium development potential
TR.TRANSPORTATION	roads
TV.TEVEG	threatened & endangered vegetation
VN.VEGETATION	vegetation
VR.VRM	visual resource management areas
WD.WITHDRAWALS	land withdrawals
WH.WILDHORSE	wild horse herd units
WL.WATER	rivers, streams
WP.WATER	reservoirs, ponds, lakes, springs
WR.PUBWATRES	public water reserves
WSA	wilderness study area

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